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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/594,510	06/16/2000	Alan G. Wood	M4065.0184/P184	2407

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EXAMINER

LUU, CHUONG A

ART UNIT PAPER NUMBER

2825

DATE MAILED: 02/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/594,510

Applicant(s)

WOOD ET AL.

Examiner

Chuong A Luu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 and 35-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 and 35-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

DETAILED ACTION

Allowable Subject Matter

The indicated allowability of claims 19-23 are withdrawn in view of the newly discovered reference(s) to be used for the rejection. Rejections based on the newly cited reference(s) follow.

PRIOR ART REJECTIONS

Statutory Basis

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The Rejections

Claims 1, 5, 6, 8-9, and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Ohgiyama (U.S. 6,309,909 B1)

Ohgiyama discloses a method of manufacturing semiconductor device by

(1) forming a layered assembly by attaching a wafer (6) to a dielectric layer (2);

subsequently, testing semiconductor devices in said wafer (6); and

subsequently, dicing said layered assembly (see columns 8 and 9, lines 50-67 and lines 1-5, respectively);

(5) wherein said step of forming said layered assembly includes the step of adhering said wafer to said dielectric layer (see Figure 7B);

(6) further comprising the step of electrically connecting said semiconductor devices to ball grid arrays on said dielectric layer (see column 9, lines 60-67);

(8) wherein said connecting step comprises the step of connecting solder bumps on said wafer to circuit traces on said dielectric layer (see column 9, lines 60-67);

(10) further comprising the step of providing a metal (conductive) layer in said layered assembly (see column 1, lines 29-32).

Claims 2-3, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgiyama (U.S. 6,309,909 B1) in view of Heo et al. (US 5,858,815)

Ohgiyama teaches the above outlined features except for input/output devices. However, Heo discloses a method for fabricating semiconductor package by **(2)** further comprising the step of connecting said semiconductor devices to input/output devices on the dielectric layer; **(3)** wherein said testing is conducted through said input/output devices (see column 8, lines 32-56); **(7)** wherein said connecting step comprises the step of locating wire bonds in openings through said dielectric layer (see columns 4, and 5, lines 49-57, and lines 1-17, respectively). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings above to apply an input/output device to conduct testing a semiconductor device.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgiyama (U.S. 6,309,909 B1) in view of Heo et al. (US 5,858,815), and further view of Lam (5,137,836)

Ohgiyama discloses everything above except for discarding one or more defective packages. However, Lam discloses a method of manufacturing a repairable multi-chip module by **(4)** further comprising the step of discarding one or more defective packages (see column 3, lines 1-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings above to discarding one or more defective chip to fabricate a semiconductor device.

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Claims 9 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgiyama (U.S. 6,309,909 B1) in view of Mizuno et al. (US 6,077,757)

Ohgiyama discloses everything above except for using a saw. However, Mizuno discloses a method of forming chip semiconductor devices with (9) wherein said dicing step is performed by a saw (see column 4, lines 17-24). It would have been obvious to one having ordinary skill in the art at the time the invention was made to dicing semiconductor chips by sawing.

Claims 11-12, and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Farnworth (U.S. 6,326,697 B1)

Farnworth discloses integrated circuit devices with

(11) forming a layered assembly by attaching a semiconductor wafer (10) and a metal layer (44) to a dielectric layer (30);

connecting semiconductor devices in said semiconductor wafer to ball grid arrays on said dielectric layer (see column 5, lines 43-50);

subsequently, dicing said layered assembly (see column 5, lines 51-53);

(12) wherein said forming step comprises the step of adhering said wafer (10) to said metal layer (44) (see column 5, lines 51-53);

(17) wherein said dicing step is performed by a saw (see column 3, lines 9-10);

(18) further comprising the step of testing said semiconductor devices through said ball grid arrays (see column 5, lines 43-67).

Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farnworth (U.S. 6,326,697 B1) in view of Heo et al. (US 5,858,815)

Farnworth discloses everything above except for wire bonds, solder bumps, vias. However, Heo discloses a method for fabricating semiconductor package by **(13)** wherein said connecting step comprises the step of locating wire bonds in openings in said dielectric layer; **(14)** further comprising the step of connecting said wire bonds to conductive traces on said dielectric layer; **(15)** wherein said connecting step comprises the step of connecting solder bumps on said wafer to conductive traces on said dielectric layer; **(16)** further comprising the step of connecting said traces to conductive vias extending through said dielectric layer (see columns 4, 5, and 6, lines 36-67, lines 1-67, and lines 1-63, respectively). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings above to form a semiconductor device.

Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farnworth (U.S. 6,326,697 B1) in view of Gaynes et al. (US 6,165,885)

Farnworth discloses integrated circuit devices with **(11)** a semiconductor wafer (10) with respect to a dielectric tape (20); subsequently, connecting semiconductor devices in said semiconductor wafer to ball grid arrays on said dielectric layer (see column 5, lines 43-50); subsequently, dicing said wafer (10) and said dielectric tape (20) (see column 5, lines 51-53).

Farnworth teaches the above outlined features except for optically aligned. However, Gaynes discloses a method of making components with solder balls by (11).... Aligning; (20) wherein said wafer is optically aligned with respect to said dielectric tape (see column 16, lines 18-29). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings above by optically aligned semiconductor components to manufacture integrated circuit devices.

Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farnworth (U.S. 6,326,697 B1) in view of Gaynes et al. (U.S. 6,165,885) and further view of Huddleston et al. (U.S. 5,834,320)

Farnworth and Gaynes teach everything above except for magnetically aligned with a magnet ring. Furthermore, Huddleston discloses a method of assembling a semiconductor device using a magnet (see columns 7 and 8, lines 44-67 and lines 1-51, respectively). It would have been obvious to one having ordinary skill in the art at the time the invention was made to magnetically aligned with a magnet ring to form a semiconductor device.

Claims 35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farnworth (U.S. 6,326,697 B1) in view of Kobayashi et al. (U.S. 4,781,969)

Farnworth discloses integrated circuit devices with

(35) connecting said semiconductor devices to respective ball grid arrays located on said substrate; testing said semiconductor devices through said ball grid arrays (see column 5, lines 36-67); **(37)** further comprising the step of singulating packages from said wafer and said substrate (see column 5, lines 51-53).

Farnworth teaches the above outlined features but lacks a disclosure of specific use of a flexible substrate. However, Kobayashi discloses a printed circuit board with **(35)**..... adhering said wafer to a flexible substrate (see column 1, lines 38-43). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Farnworth and Kobayashi to use a flexible substrate to fabricate a semiconductor device.

Claims 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farnworth (U.S. 6,326,697 B1) in view of Kobayashi et al. (U.S. 4,781,969), and further view of Lam (5,137,836)

Farnworth and Kobayashi disclose everything above except for identifying defective packages. Furthermore, Lam discloses a method of manufacturing a repairable multi-chip module by **(36)**; **(38)** further comprising the step of segregating defective packages from other packages (see column 3, lines 1-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to

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combine the teachings above to identifying one or more defective chip during fabrication of a semiconductor device.

Response to Arguments

Applicant's arguments with respect to claims 1-23, and 35-38 have been considered but are moot in view of the new ground(s) of rejection.

Applicants argue that Mizuno fails to disclose or suggest the step of "testing semiconductor devices in said wafer". However, Ohgiyama discloses a method of manufacturing semiconductor device (see column 8, lines 55-67), and Farnworth discloses a method of fabricating integrated circuit devices (see columns 5 and 6, lines 36-67 and lines 1-13, respectively).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A Luu whose telephone number is (703)305-0129. The examiner can normally be reached on M-F (7:30-4:00).

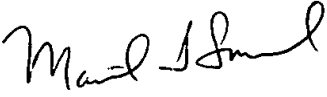
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (703)308-1323. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Chuong Anh Luu
Assistant Examiner

CAL
February 5, 2002


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